

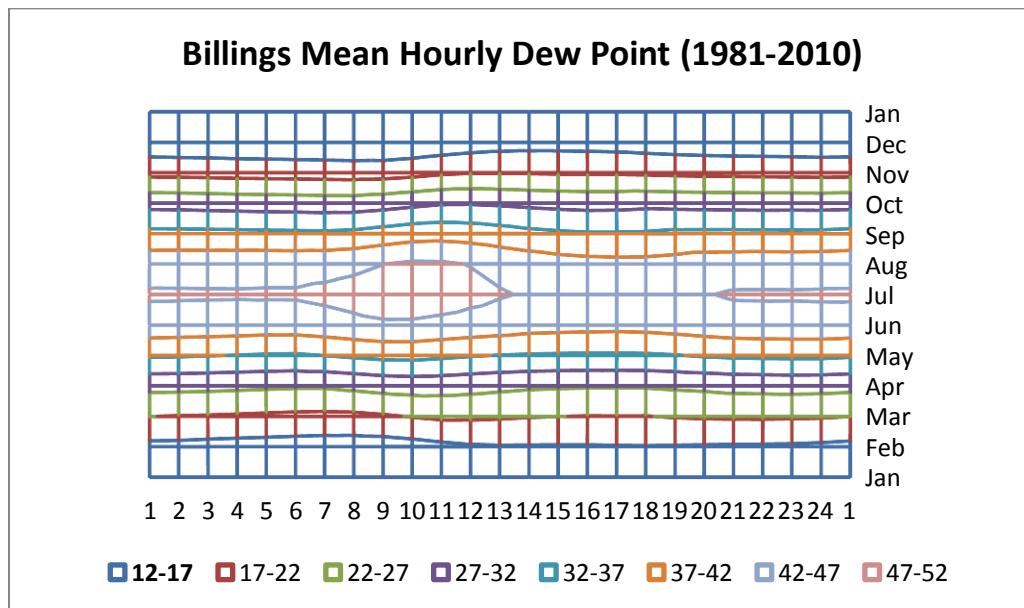
8 Humidity

8.1 General Description

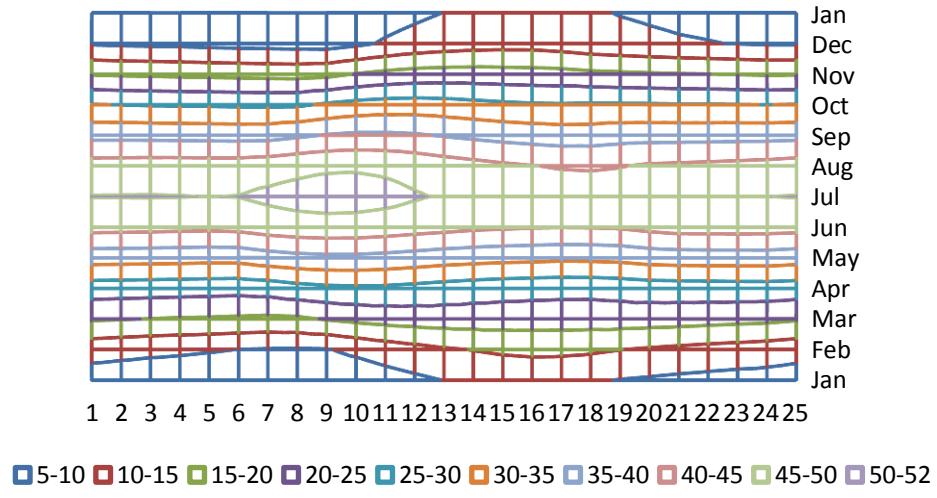
Montana's annual average relative humidity (RH) is quite low and is especially low in summer. During the warmer part of the summer days, the humidity drops to about 25 to 30% and on a few occasions it will be as low as five to 10%. Late at night, when the temperature is lowest, the humidity will generally rise to 65 or 75%. This results in an average diurnal variation of about 40 to 45% during the summer, but in the winter the variation is much less. Low RH, high percentage of sunshine, and rather high average winds all contribute to a high rate of evaporation. With dew point temperatures generally in the upper 40s during the summer, people get a break from the sweating and discomfort. Lower dew point temperatures assure cool summer nights. Though humidities vary across the state, at Great Falls, the average humidity is highest during the winter month. The average January humidity is 64 percent, while in August it drops to 45.8 percent.

8.2 Mean hourly dew point values in Montana

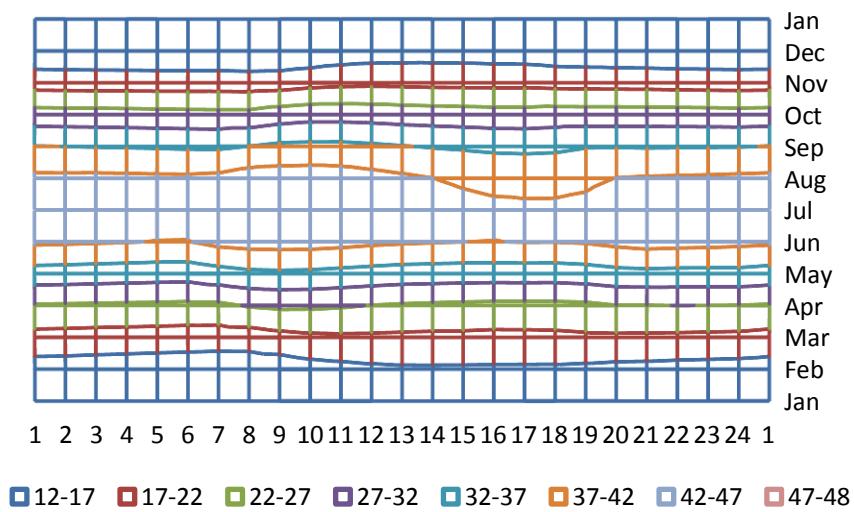
The following figures show mean hourly dew point temperature for several locations across the state. At all locations, the highest dew point temperatures are during the summer months, with lowest during the winter.



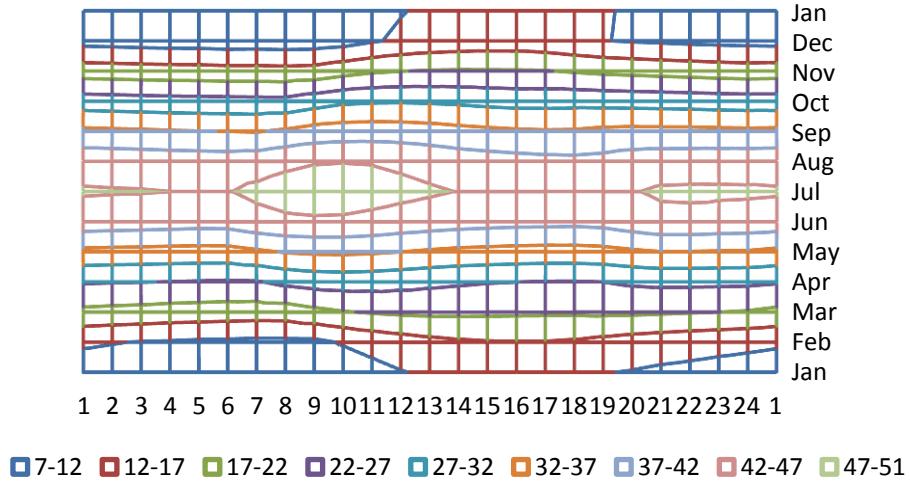
Glasgow Mean Hourly Dew Point (1981-2010)



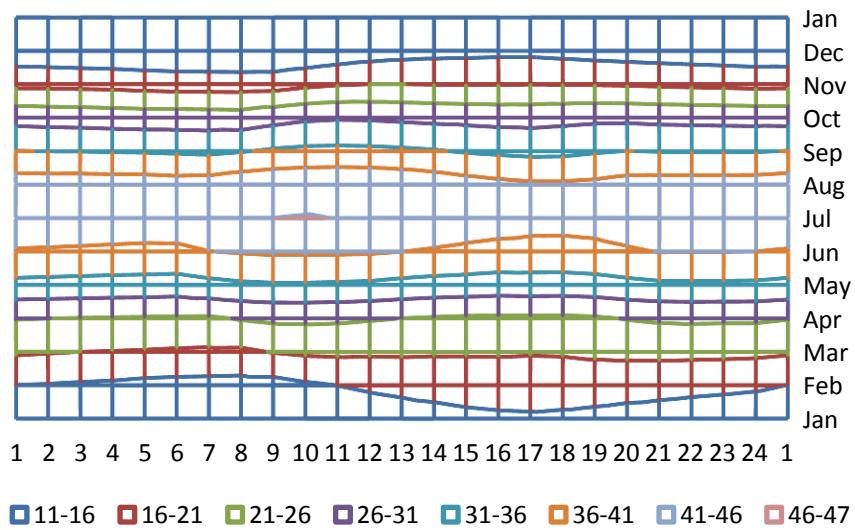
Great Falls Mean Hourly Dew Point (1981-2010)



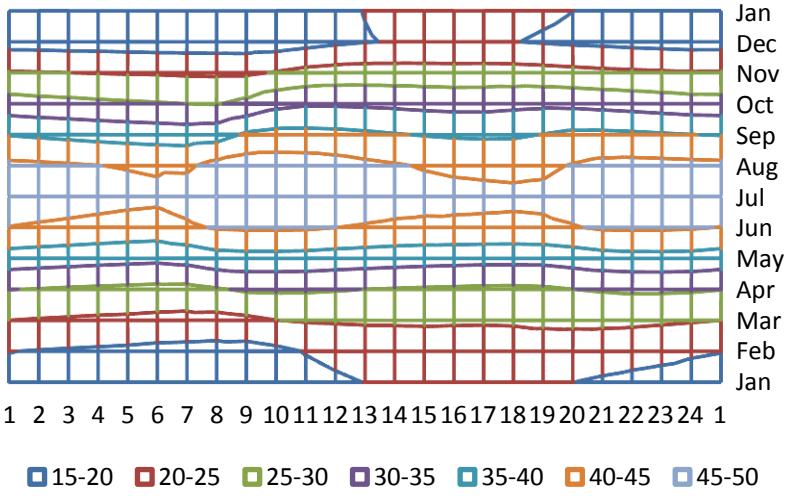
Havre Mean Hourly Dew Point (1981-2010)



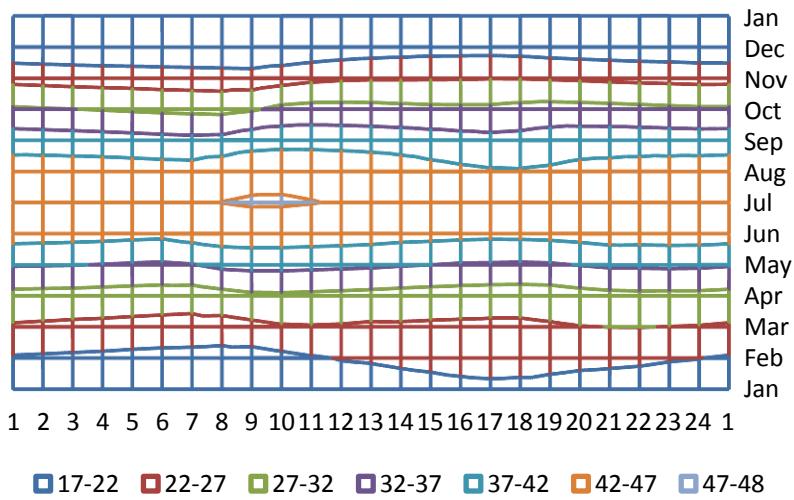
Helena Mean Hourly Dew Point (1981-2010)



Kalispell Average Hourly Dew Point (1981-2010)



Missoula Mean Hourly Dew Point (1981-2010)



8.3 Record dew point values

The highest dew point temperature recorded in the state likely occurred at Sidney. The dew point reached 81°F on August 3, 2001.

Table 8.1. Other record dew points across the state (F):

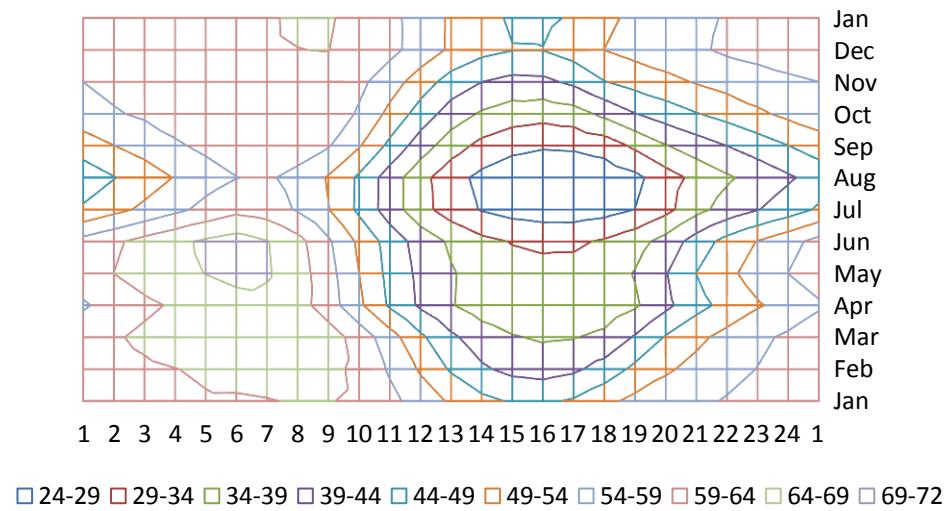
| | | |
|-------------|----------------------------|--|
| Baker | 74 73 72 70 70 | 28 Jun 2002 18 Jul 2011 27 Jul 1998 23 Jul 2005 18 Jul 2003 |
| Billings | 69 69 69 67 66 | 28 Jun 1997 1 Jul 2010 27 Jun 2001 27 Jun 2001 17 Jul 2011 |
| Bozeman | 70 69 65 65 65 | 25 Jun 1997 26 Jun 2002 4 Jul 2001 21 Jun 2005 15 Jul 1954 |
| Butte | 63 63 61 61 61 | 13 Jul 2002 9 Aug 1983 18 Jul 2013 03 Jul 2013 18 Jul 2004 |
| Cut Bank | 68 68 65 64 64 | 11 Jul 2002 3,5 Jul 1975 14 Jul 2012 06 Sep 2013 25 June 2012 |
| Dillon | 68 68 67 67 66 | 09 Aug 1989 10 Aug 1982 28 Jul 1990 11 Jul 1986 18 Aug 1982 |
| Glasgow | 74 74 72 72 72 | 4,5 Jul 1975 25 Jun 2012 18 Jul 2011 21 Jun 2005 24 Jul 2007 |
| Glendive | 75 74 73 73 73 | 18,19 Jul 2011 20 Jul 1979 18 Jul 2011 26 Jul 2010 22 Jul 2007 |
| Great Falls | 70 66 65 65 | 2 Jul 1975 10 Jul 1998 11 Jul 2002 21 Jun 2005 |

| | | |
|------------|----|----------------|
| | 64 | 14 Jul 2012 |
| Havre | 75 | 17,19 Jul 1998 |
| | 74 | 3 Aug 1997 |
| | 72 | 30 Jul 1997 |
| | 72 | 27 Jun 2002 |
| | 72 | 02 Jul 1978 |
| Helena | 69 | 4 Jul 1975 |
| | 68 | 28 Jul 1944 |
| | 68 | 31 Aug 1936 |
| | 66 | 17 Jul 2013 |
| | 66 | 14 Jul 2002 |
| Kalispell | 67 | 10 Aug 1983 |
| | 67 | 3 Jul 1975 |
| | 66 | 02 Jul 2013 |
| | 64 | 06 Sep 2013 |
| | 64 | 14 Jul 2012 |
| Lewistown | 72 | 3 Jul 1975 |
| | 69 | 25 Jun 2012 |
| | 68 | 27 Jul 1987 |
| | 68 | 05 Aug 1973 |
| | 66 | 29 Jun 2002 |
| Miles City | 74 | 04 Jul 1937 |
| | 73 | 14 Aug 1935 |
| | 71 | 21 Jun 2005 |
| | 71 | 16 Jul 1920 |
| | 70 | 17,18 Jul 2011 |
| Missoula | 67 | 17 Jul 2004 |
| | 67 | 15 Jul 1936 |
| | 66 | 3 Jul 1975 |
| | 66 | 22 Jul 1943 |
| | 65 | 11 Jul 1942 |
| Sidney | 81 | 3 Aug 2001 |
| | 77 | 18 Jul 2011 |
| | 76 | 29 May 1988 |
| | 73 | 11 Jul 2013 |
| | 73 | 11 Jul 1998 |

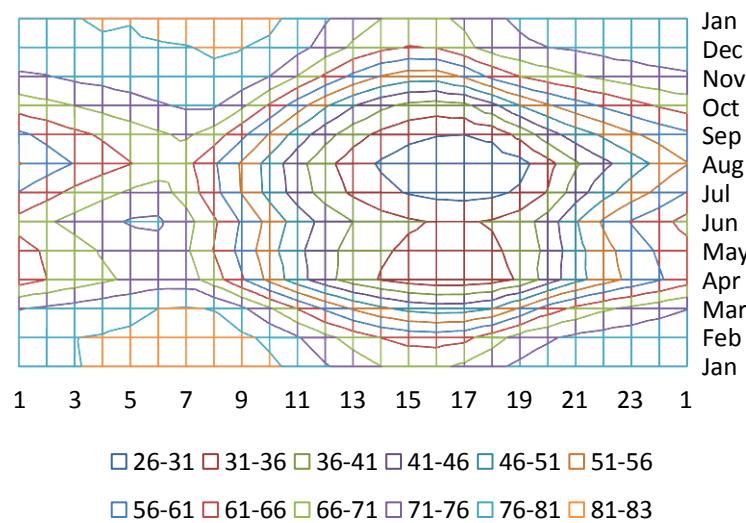
8.4 Mean hourly Relative Humidity across Montana

For the following charts, mean hourly RH is depicted by month for several locations across the state. These plots show that the lowest humidities occur during the afternoons during the summer.

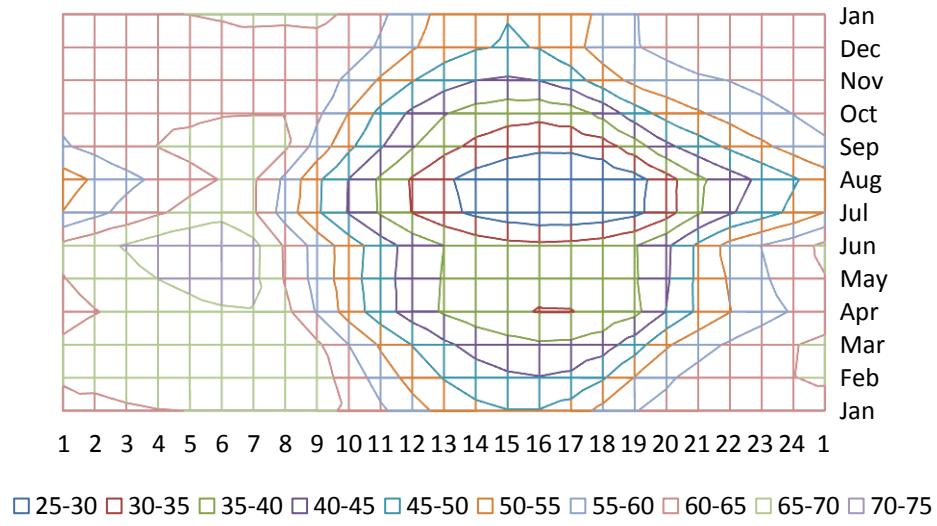
Billings Mean Hourly RH (1981-2010)



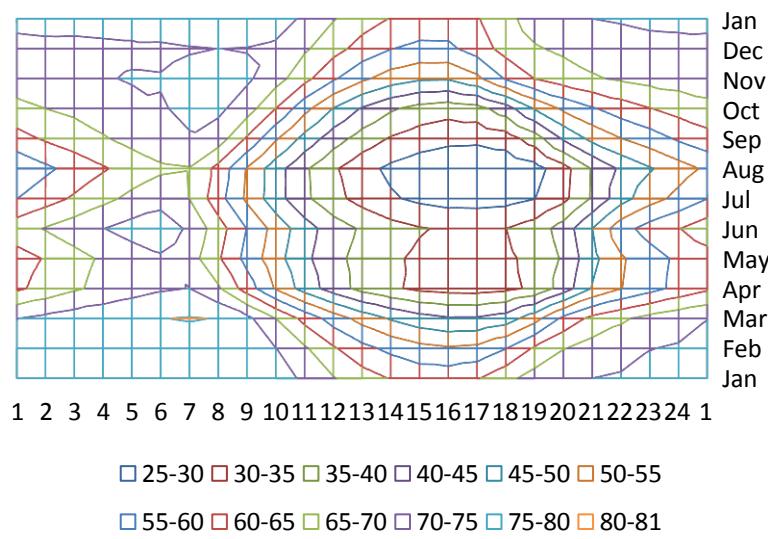
Glasgow Mean Hourly RH (1981-2010)



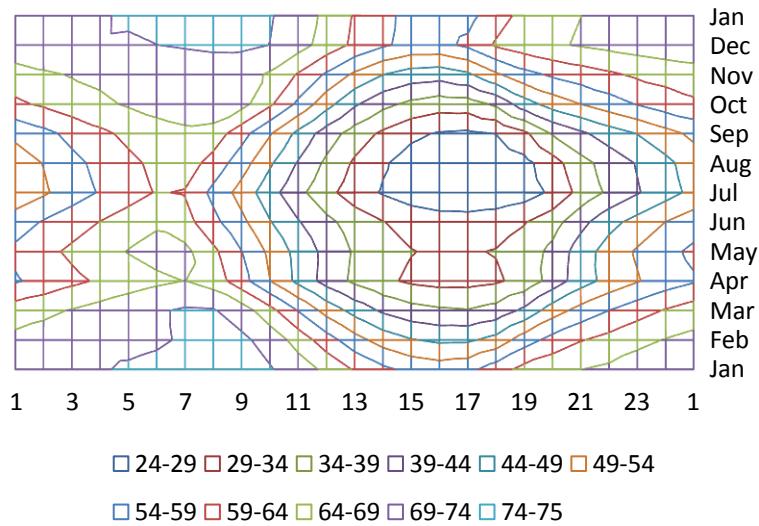
Great Falls Mean Hourly RH (1981-2010)



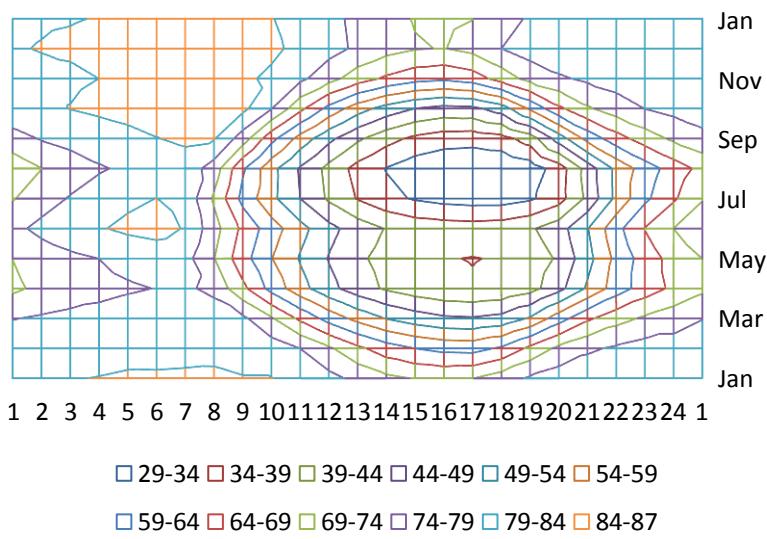
Havre Mean Hourly RH (1981-2010)

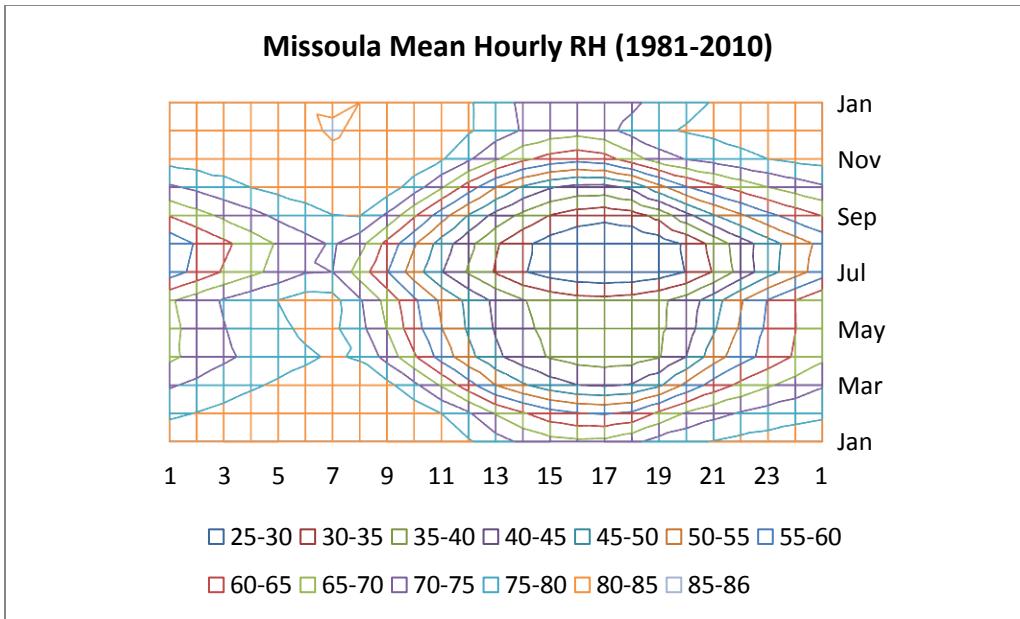


Helena Mean Hourly RH (1981-2010)



Kalispell Mean Hourly RH (1981-2010)





Threshold dew points in Montana

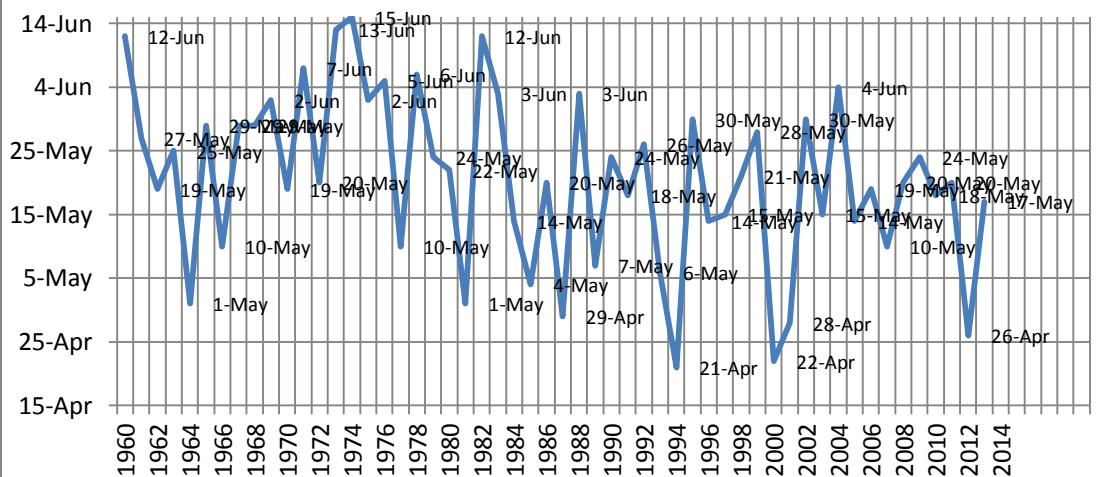
Fifty-degree

While high dew points are relatively uncommon, a dew point of 50°F has some significance in central Montana. When dew points exceed 50°F, low-level moisture causes people to comment on humidity. It can also be a harbinger of spring and the end of summer. This threshold may also be used to indicate whether moisture from the Gulf of Mexico or Pacific has reached the area. Following are a set of charts showing the date of the first 50°F dew point at Great Falls, since 1960, the date of the last 50°F dew point, the date of the first two-day stretch of 50°F dew points, and the date of the last two-day stretch.

Sixty-degree or higher

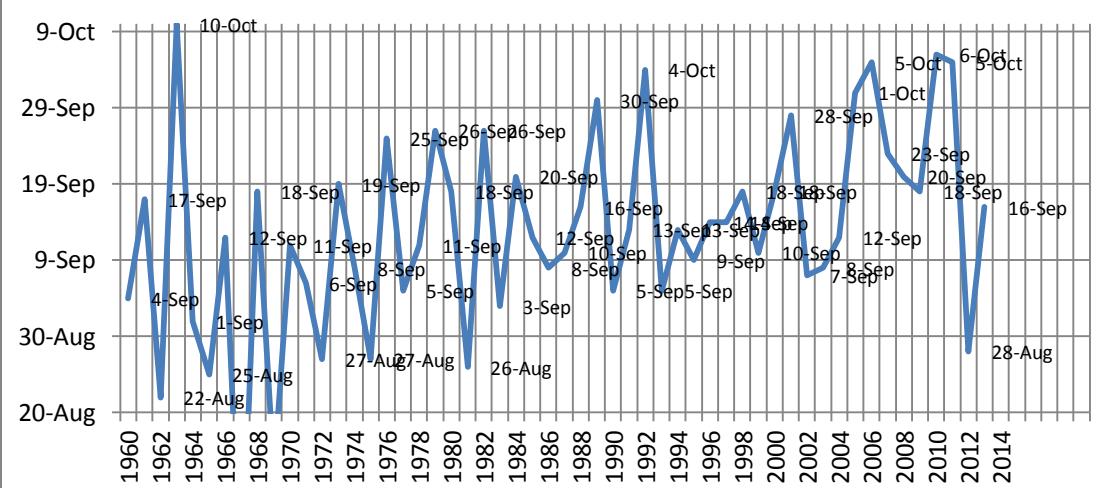
Sixty-degree or higher dew point temperatures are a point at which most people express some form of discomfort. Portions of central and western Montana can go a year or more with no sixty-degree dew point values. As one moves eastward, the likelihood becomes greater. Anomalously high dew points are relatively rare. Sidney recorded the highest dew point in the state in August 2001, reaching 81°F. Highest dew points are most common in July and August, when Gulf of Mexico air moves well inland. Some out-of-season high dew points have also occurred. In September 2013, Great Falls recorded their latest 60°F or higher dew points. Before this, no 60°F dew points had been recorded in September.

First 50°F dew point at Great Falls



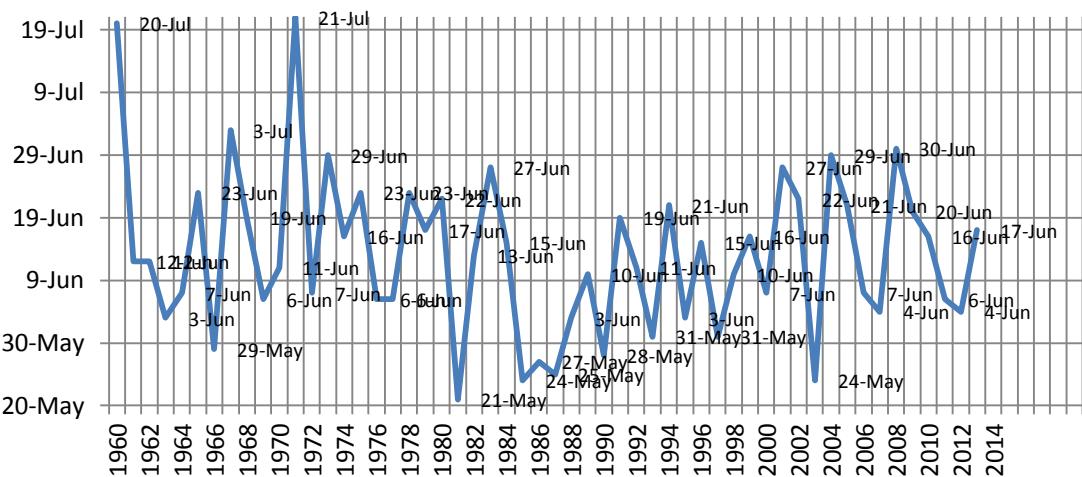
Average date is May 20.

Last 50°F dew point at Great Falls



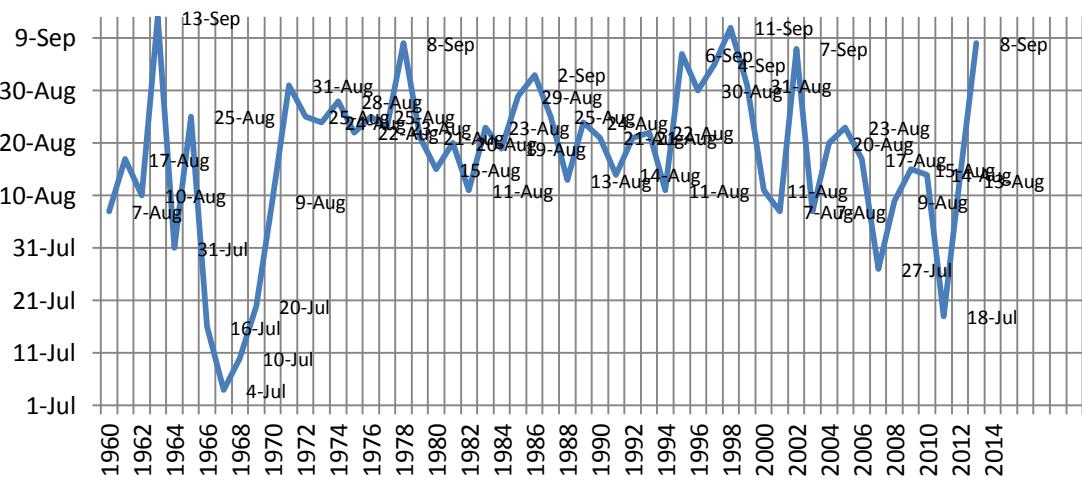
Average date is September 12.

First two-day stretch of 50°F dew point at Great Falls



Average date is June 13.

Last two-day stretch of 50°F dew point at Great Falls



Average date is August 17.